

combined. Where an answer is only on one list, it is possible to still add that answer on the matching answer list, by averaging the confidence value associated with the answer with a second confidence value of zero or weighting the confidence value to reflect the fact that it was only on one list. For extremely high confidence values for a single answer, this might still provide a significant answer on the answer list of matching answers.

IN THE CLAIMS:

Add new claims 4-26 appearing below:

4. (New) The apparatus of claim 1, wherein the string of characters is a series of alphanumeric characters and spaces that make up a word, a sequence of words, one or more numbers, or a mix of words, alphabetic characters and numbers.

5. (New) The apparatus of claim 1, wherein the means for finding comprises:
means for matching one or more recognition answers of the first answer list to one or more recognition answers of the second answer list to generate one or more matching answer pairs, each matching answer pair having an associated combined confidence value; and
means for evaluating the combined confidence value associated with each matching answer pair to designate a matching answer pair having a highest combined confidence value as the best recognition answer.

6. (New) The apparatus of claim 5, wherein the combined confidence value associated with each matching answer pair is defined by an average of the confidence values of the recognition answer of the first answer list and the recognition answer of the second answer list of the matching answer pair.

7. (New) The apparatus of claim 5, wherein the means for finding comprises:
means for testing the highest combined confidence value against a next to highest combined confidence value to define an answer separation value; and
means for rejecting the matching word pair associated with the highest combined confidence value as the best recognition answer if the answer separation value is less than a predetermined threshold value.

8. (New) The apparatus of claim 1, wherein the means for finding comprises:
means for evaluating a highest confidence value of the first answer list and a highest
confidence value of the second answer list against a probability algorithm to identify the best
recognition answer for the string of characters.

9. (New) The method of claim 2, wherein the input phrase and each reference
phrase is a series of alphanumeric characters and spaces that make up a word, a sequence of
words, one or more numbers, or a mix of words, alphabetic characters and numbers.

10. (New) The method of claim 3 further comprising:
identifying each of the plurality of possible answers of the first recognition answer list
with a metastroke confidence value corresponding to a degree of similarity between the
metastrokes representing the input word and the prototype string of metastrokes associated with
each possible answer in the first recognition answer list; and

identifying each of the plurality of possible answers of the second recognition answer list
with a confidence value based on a character recognition confidence value of each character
variant in each possible answer in the second recognition answer list, the character recognition
confidence value corresponding to a degree of similarity between the character variant and the
matched character cutout image.

11. (New) The method of claim 10, wherein the operation of identifying each of the
plurality of possible answers of the second recognition list comprises:
combining the character recognition confidence value of each character variant in each of
the plurality of possible answers of the second recognition answer list to generate a resultant
confidence value for each of the plurality of possible answers.

12. (New) The method of claim 11, wherein the finding operation comprises:
matching one or more possible answers of the first recognition list to one or more
possible answers of the second recognition list to produce one or more matching answer pairs;
combining the metastroke confidence value associated with the possible answer of the
first recognition answer list and the resultant confidence value associated with the possible

answer of the second recognition answer list in each matching pair to define a combined confidence value for each pair; and

designating the matching answer pair having a highest combined confidence value as the recognition of the input word.

13. (New) The method of claim 12, wherein the finding operation further comprises: testing the highest combined confidence value against a next to highest combined confidence value to define an answer separation value; and

rejecting the matching word pair associated with the highest combined confidence value as the recognition of the input word if the answer separation value is less than a predetermined threshold value.

14. (New) A handwritten text recognition system for interpreting a handwritten word input to the system as a word image and providing a word interpretation to a computing system, the handwritten text recognition system comprising:

a holistic recognition module breaking the word image into a plurality of character features and matching the plurality of character features to a plurality of prototype character features for predetermined words to provide a holistic word answer;

an analytical recognition module receiving the word image as a plurality of character images and recognizing each of the plurality of character images as a character in an analytic word answer; and

an answer module identifying one of the holistic word answer and the analytic word answer as the word interpretation.

15. (New) The system of claim 14 wherein:

the holistic recognition module identifies the holistic word answer with a holistic confidence value corresponding to a degree of similarity between the plurality of character features for the word image and the plurality of prototype character features for the holistic word answer;

the analytical recognition module identifies the analytic word answer with an analytic confidence value based on a character recognition confidence value of each character in the analytic word answer; and

the answer module comparing the holistic confidence value and the analytic confidence value to designate the one of the holistic word answer and the analytic word answer associated with a highest confidence value as the word interpretation.

16. (New) The system of claim 14, wherein:

the holistic recognition module generates a holistic answer list, the holistic answer list including one or more possible holistic word answers, each possible holistic word answer being associated with a confidence value corresponding to a degree of similarity between the plurality of character features for the word image and a plurality of prototype character features for the possible holistic word answer; and

the analytical recognition module generates an analytic answer list, the analytic answer list including one or more possible analytic word answers, each possible analytic word answer being associated with a confidence value based on a character recognition confidence value of each character in the analytic word answer.

17. (New) The system of claim 16, wherein the answer module matches one or more of the plurality of the possible holistic word answers to one or more of the plurality of possible analytic word answers to generate one or more matching answer pairs, each matching answer pair having a combined confidence value defined by an average of the confidence values associated with the possible holistic word answer and the possible analytic word answer of the matching word pair.

18. (New) The system of claim 17, wherein the answer module further comprises: a selection module evaluating the combined confidence value for each matching answer pair to designate the matching answer pair having a highest combined confidence value as the word interpretation.

19. (New) The system of claim 18, wherein the answer module further comprises: a separation module testing the highest combined confidence value against a next to highest combined confidence value in the matching answer list to define an answer separation value; and

5 a rejection module to reject the matching answer pair associated with the highest combined confidence value as the word interpretation if the answer separation value is less than a predetermined threshold value.

20. (New) The system of claim 16, wherein the answer module receives the possible holistic word answer associated with a highest confidence value in the holistic answer list and the possible analytic word answer associated with a highest confidence value in the analytic answer list, the answer module further comprising:

5 a selection module evaluating the highest confidence values associated with the received possible holistic and analytic word answers against a probability algorithm and defining one of the possible holistic word answer and the possible analytic word answer as the word interpretation.

ATD
CDN'4
21. (New) The system of claim 14, wherein the holistic recognition module comprises a segmentation module dividing the holistic word answer into a plurality of character feature sets, wherein each character feature set is associated with a character of the holistic word answer and divided into segmented features, the system further comprising:

5 a translate module locating the segmented features on the word image, filling the word image between segmented features and breaking the word image into the plurality of character images at one or more segmentation points defined between adjacent character feature sets.

22. (New) A method for interpreting a handwritten word input to a computing system comprising:

digitizing the handwritten word to generate a word image;

generating a holistic word answer for the word image;

5 generating an analytic word answer for the word image;

comparing the holistic word answer to the analytic word answer; and

designating one of the holistic word answer and the analytic word answer as an interpretation of the handwritten word.

23. (New) The method of claim 22, wherein the operation of generating a holistic word answer comprises:

dividing the word image into a plurality of character features;

matching each character feature to one of a plurality of prototype character features;

5 generating a plurality of possible holistic word answers each associated with a confidence value corresponding to a degree of similarity between the plurality of character features for the word image and the plurality of prototype character features for each possible holistic word answer;

10 compiling the plurality of possible holistic word answers and associated confidence values into a holistic answer list; and

selecting from the holistic answer list a possible holistic word answer having a highest confidence value to be the holistic word answer.

24. (New) The method of claim 23, wherein the operation of generating an analytic word answer comprises:

receiving the word image as a plurality of character images;

defining each character image as a character;

5 generating a plurality of possible analytic word answers, each possible analytic word answer having a confidence value based on a character recognition confidence value of each character in the possible analytic word answer;

compiling the plurality of possible analytic word answers and associated confidence values into an analytic answer list; and

10 selecting from the analytic answer list a possible analytic word answer having a highest confidence value to be the analytic word answer.

25. (New) The method of claim 24, wherein the designating operation comprises:

matching one or more possible holistic word answers to one or more possible analytic word answers to produce one or more matching answer pairs;

5 combining the confidence values of the possible holistic word answer and the possible analytic word answer in each matching answer pair to define a combined confidence value for each pair; and

selecting the matching answer pair having a highest combined confidence value as the interpretation of the handwritten word.

26. (New) The method of claim 24, wherein the operation of generating a holistic word answer further comprises:

dividing the holistic word answer into a plurality of character feature sets, each character feature set being associated with a character of the holistic word answer; and

5 dividing each character feature set into a plurality of segmented features.

27. (New) The method of claim 26 further comprising:

locating the segmented features on the word image;

filling the word image between the segmented features to define a string of connected character images;

5 defining one or more hypothetical segmentation points between adjacent character feature sets on the string of connected character images; and

breaking the string of connected character images into a plurality of character images at the hypothetical segmentation points.

28. (New) The method of claim 27, wherein the operation of generating an analytic word answer further comprises:

receiving the plurality of character images;

recognizing each character image as being associated with a character;

5 collecting one or more character variants associated with each of the plurality of character images;

storing the character variants associated with each of the plurality of character images;

comparing the character variants associated with each character image to a lexicon of words in a dictionary based on the character location associated with the character variant;

10 discarding each character variant that does not form a character in a word in the dictionary when placed in the word image at the character location associated with the character variant; and